EXHIBIT 6

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EXAMINER	
LI, SHI K	

ART UNIT	PAPER NUMBER
2613	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/448,559	NGO, DAT D.	
	Examiner	Art Unit	
	Shi K. Li	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 September 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,7-12,14-22 and 24-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,7-12,14-22 and 24-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-2 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vieregge et al. (U.S. Patent 6,915,463 B2).

Regarding claims 1 and 22, Vieregge et al. teaches in FIG. 1 an optical ring network comprising a plurality of network nodes. Vieregge et al. teaches in FIG. 2 the structure of a network node comprising a quality determination module 20 and failure predictor module 22. Vieregge et al. teaches in col. 5, lines 49-64 the operation of the predictor 22. Vieregge et al. teaches in line 61 that two predictive thresholds (both below the failure threshold) may be used, and if the two thresholds are crossed in a short enough period of time, then the decision to instigate protection switching is made. That is Vieregge et al. teaches comparing collected BER values to a predetermined BER threshold level. Vieregge et al. teaches that if each of the two recent ones of said collected BER values exceed the predetermined BER threshold level, determining whether said collected BER values worsen over time and perform protection switch if the BER values worsen. The difference between Vieregge et al. and the claimed invention is that Vieregge et al. does not teach in the same paragraph storing said BER values. However Vieregge et al. teaches in col. 7, lines 5-7 storing BER values in a memory of the block 22. One of ordinary skill in the art would have been motivated to combine the teaching of col. 7, lines 5-7 with the method of col. 5, lines 49-64 because storing BER values in memory makes it easy to retrieve data for analysis. Thus it would have been obvious to one of ordinary skill in the art at

the time the invention was made to store BER values in memory, as taught in col. 7, lines 5-7 of Vieregge et al., in the method of col. 5, lines 49-64 because storing BER values in memory makes it easy to retrieve data for analysis.

Regarding claim 2, Vieregge et al. teaches in col. 7, lines 7-9 that the block 20 continues to measure BER at periodic intervals.

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vieregge et al. (U.S. Patent 6,915,463 B2) in view of Gillett (U.S. Patent 5,627,837).

Vieregge et al. has been discussed above in regard to claim 1, 2 and 22. The difference between Vieregge et al. and the claimed invention is that Vieregge et al. does not teach array for storing the BER values. Gillett teaches in col. 6, lines 35-40 circular buffer known as array for storing data for processing. One of ordinary skill in the art would have combined the teaching of Gillett with the modified scheme of Vieregge et al. because the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an array for storing data for processing, as taught by Gillett, in the modified scheme of Vieregge et al. because the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

4. Claims 7-9 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vieregge et al. and Gillett as applied to claim 3 above, and further in view of Soltysiak et al. (U.S. Patent 6,775,237 B2).

Vieregge et al. and Gillett have been discussed above in regard to claim 3. The difference between Vieregge et al. and Gillett and the claimed invention is that Vieregge et al.

and Gillett do not teach using flag for counting. The use flag for counting is well known in the art. For example, Soltysiak et al. teaches in FIG. 3 counters (equivalent to flag of instant claim) for keeping track of events. One of ordinary skill in the art would have combined the teaching of Soltysiak et al. with the modified scheme of Vieregge et al. and Gillett because the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use flag or counter for keeping track of events, as taught by Soltysiak et al., in the modified scheme of Vieregge et al. and Gillett because the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

5. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vieregge et al. (U.S. Patent 6,915,463 B2) in view of Li (U.S. Patent Application Pub. 2002/0018616 A1) and Ryhorchuk et al. (U.S. Patent 7,113,698 B1).

Vieregge et al. has been discussed above in regard to claim 1, 2 and 22. The difference between Vieregge et al. and the claimed invention is that Vieregge et al. does not teach the details of the protection scheme. Li teaches in FIG. 3 a ring network. Li teaches in FIG. 23 a two-fiber ring where λk to the east side is the working channel for primary A. In a ring switch, traffic of primary A is switched to the same wavelength toward the west side. In a span switch, traffic of primary A is switched to λj toward the west side. One of ordinary skill in the art would have been motivated to combine the teaching of Li with the ring network of Vieregge et al. because the node architecture of Li is simple yet effective. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the protection scheme of

Li in the ring network of Vieregge et al. because the node architecture of Li is simple yet effective.

The combination of Vieregge et al. and Li still fails to teach an out-of-band signal. Ryhorchuk et al. teaches in col. 8, lines 46-50 optical supervisory channel which carries out-of-band signal. It is also obvious that if the in-band data channel fails while the OSC channel is working, it indicates a channel failure and span switch is appropriate. If both the in-band data channel and the OSC channel fail, it indicates a fiber failure and ring switch is necessary. One of ordinary skill in the art would have been motivated to combine the teaching of Ryhorchuk et al. with the modified ring network of Vieregge et al. and Li because OSC channel can be used for communicating status information between nodes. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include an OSC channel, as taught by Ryhorchuk et al., in the modified ring network of Vieregge et al. and Li because OSC channel can be used for communicating status information between nodes.

6. Claims 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Boer et al. (U.S. Patent 6,917,759) in view of Hartmann et al. (U.S. Patent 6,851,062 B2).

Regarding claim 12, de Boer et al. teaches shared mesh protection scheme. de Boer et al. teaches in FIG. 7 detect failure step 118, transmit switching request step 124, ack received testing step 126 and timeout condition testing step 140. The difference between de Boer et al. and the claimed invention is that de Boer et al. does not teach how to determine the timeout interval. While an acknowledgement is an indication of the completion of a remote operation, timeout is an indication of the failure of a remote operation. It is obvious that the time interval between the transmitting of the remote operation command and the time an acknowledgement is

expect to be received is the sum of the round trip time for messages to travel between the local node and the remote node and the operation time. If timeout interval is too small, failure of remote operation may be declared prematurely before an acknowledgement arrives. On the other hand, if timeout interval is too large, it delays actions for correcting the failure. That is, the timeout period should depend on the round trip time between local node and remote node. For example, Hartmann et al. teaches in col. 4, lines 44-65 a formula for calculating timeout based on round trip time. It is also obvious that the round time depends on the number of nodes in the network and the distance between the nodes. One of ordinary skill in the art would have been motivated to combine the teaching of Hartmann et al. with the protection scheme of de Boer et al. because timeout interval should be selected according to the expected time interval for receiving an acknowledgement as explained above. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine timeout interval based on number of nodes in the network and the distance between nodes, as taught by Hartmann et al. and common sense, in the protection scheme of de Boer et al.

Regarding claim 14, de Boer et al. teaches in FIG. 7 establish protection path step 126.

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over de Boer et al. and Hartmann et al. as applied to claims 12 and 14 above, and further in view of Vieregge et al. (U.S. Patent 6,915,463 B2).

de Boer et al. and Hartmann et al. have been discussed above in regard to claims 12 and 14. The difference between de Boer et al. and Hartmann et al. and the claimed invention is that de Boer et al. and Hartmann et al. do not teach determining failure by analyzing BER. Vieregge et al. teaches determining failure by analyzing BER as discussed above in regard to claims 1-2

and 22. One of ordinary skill in the art would have been motivated to combine the teaching of Vieregge et al. with the modified protection switching scheme of de Boer et al. and Hartmann et al. because the method of Vieregge et al. provides protection switch ahead of the failure and prevents service interruption. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the BER analyzing method of Vieregge et al. in the modified protection switching scheme of de Boer et al. and Hartmann et al. because the method of Vieregge et al. provides protection switch ahead of the failure and prevents service interruption.

8. Claims 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Boer et al., Hartmann et al. and Vieregge et al. as applied to claim 15 above, and further in view of Soltysiak et al. (U.S. Patent 6,775,237 B2).

de Boer et al., Hartmann et al. and Vieregge et al. have been discussed above in regard to claim 15. The difference between de Boer et al., Hartmann et al. and Vieregge et al. and the claimed invention is that de Boer et al., Hartmann et al. and Vieregge et al. do not teach using flag for counting. The use flag for counting is well known in the art. For example, Soltysiak et al. teaches in FIG. 3 counters (equivalent to flag of instant claim) for keeping track of events. One of ordinary skill in the art would have combined the teaching of Soltysiak et al. with the modified scheme of de Boer et al., Hartmann et al. and Vieregge et al. because the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use flag or counter for keeping track of events, as taught by Soltysiak et al., in the modified scheme of de Boer et al., Hartmann et al. and Vieregge et al. because the

combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

9. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (U.S. Patent Application Pub. 2002/0018616 A1) in view of Ryhorchuk et al. (U.S. Patent 7,113,698 B1).

Regarding claim 20, Li teaches in FIG. 3 a ring network. Li teaches in FIG. 23 a two-fiber ring where λk to the east side is the working channel for primary A. In a ring switch, traffic of primary A is switched to the same wavelength toward the west side. In a span switch, traffic of primary A is switched to λj toward the west side. (See paragraph [0052].) The difference between Li and the claimed invention is that Li does not teach an out-of-band signal. Ryhorchuk et al. teaches in col. 8, lines 46-50 optical supervisory channel which carries out-of-band signal. It is also obvious that if the in-band data channel fails while the OSC channel is working, it indicates a channel failure and span switch is appropriate. If both the in-band data channel and the OSC channel fail, it indicates a fiber failure and ring switch is necessary. One of ordinary skill in the art would have been motivated to combine the teaching of Ryhorchuk et al. with the ring network of Li because OSC channel can be used for communicating status information between nodes. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include an OSC channel, as taught by Ryhorchuk et al., in the ring network of Li because OSC channel can be used for communicating status information between nodes.

Regarding claim 21, Li teaches that in span switch, both the working and protection channels are sent toward the east side and share the same multiplex. In ring switch, the protection channel is sent toward the west side which uses another multiplexer.

10. Claims 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vieregge et al., Gillett and Soltysiak et al. as applied to claims 7-9 and 24-26 above, and further in view of de Boer et al. (U.S. Patent 6,917,759).

Vieregge et al., Gillett and Soltysiak et al. have been discussed above in regard to claims 7-9 and 24-26. The difference between Vieregge et al., Gillett and Soltysiak et al. and the claimed invention is that Vieregge et al., Gillett and Soltysiak et al. do not teach transmitting a switching request periodically until the expiration of a predetermined time or until receipt of an acknowledgement signal. de Boer et al. teaches shared mesh protection scheme. de Boer et al. teaches in FIG. 7 detect failure step 118, transmit switching request step 124, ack received testing step 126 and timeout condition testing step 140. One of ordinary skill in the art would have combined the teaching of de Boer et al. with the modified scheme of Vieregge et al., Gillett and Soltysiak et al. because the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Thus it would have been obvious to one of ordinary skill in the art at the time the invention to transmit a switching request periodically until the expiration of a predetermined time or until receipt of an acknowledgement signal, as taught by de Boer et al., in the modified scheme of Vieregge et al., Gillett and Soltysiak et al. because the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Regarding claim 28, de Boer et al. teaches in FIG. 7 establish protection path step 126.

Response to Arguments

11. Applicant's arguments filed 9 September 2008 have been fully considered but they are not persuasive.

Regarding claim 1, the Applicant argues that Vieregge fails to teach or suggest at least the limitations of "comparing each of a plurality of recent ones of said collected BER values to a predetermined BER threshold level; determining, for each of said recent ones of said collected BER values, whether said recent BER value exceeds said predetermined BER threshold level; in response to a determination that each of said recent ones of said collected BER values exceeds the predetermined BER threshold level, determining whether said collected BER values worsen over time; in response to a determination that said collected BER values worsen over time, detecting an indication of BER degradation," as claimed in Applicant's claim 1.

The Applicant argues that Vieregge merely discloses determining that a rate of increase of BER measurements must exceed some value and fails to teach or suggest determining whether BER values worsen over time, as claimed in Applicant's claim 1. The Examiner disagrees. Vieregge et al. teaches in col. 5, lines 49-60 that some intelligence is employed to distinguish between a scenario in which the BER is temporarily increased, but a failure is not about to occur and the scenario that a failure is likely to occur soon by, e.g., the rate of increase, or by a first or higher order derivative.

The Applicant argues “Vieregge merely states that a combination of the two indicators (namely, the latest BER value exceeding a threshold and a rate of increase between two consecutive measurements exceeding some value) is used to predict a failure, without any teaching or suggestion of any other relationship between these indicators. Thus, Vieregge fails to

teach or suggest that determining whether BER values worsen over time is performed in response to a determination that each of recent ones of collected BER values exceed a predetermined BER threshold level, as claimed in Applicant's claim 1." The Examiner disagrees. Vieregge et al. teaches in col. 5, lines 61-64 to use two predicative thresholds may be used, and if the two thresholds are crossed in a short enough period of time, then the decision to instigate protection switching is made. Note that inherently, or obviously, the second predictive threshold is higher than the first predictive threshold and the two samples both exceed the lower predictive threshold.

The Applicant argues "Applicant's claim 1 includes limitations of collecting BER values, comparing each of a plurality of recent ones of the collected BER values to a predetermined BER threshold level, determining for each of the recent ones of the collected BER values whether the recent BER value exceeds the predetermined BER threshold level, and in response to a determination that each of the recent ones of the collected BER values exceeds the predetermined BER threshold level, determining whether the collected BER values worsen over time. As claimed in Applicant's claim 1, the recent ones of the collected BER values compared to the predetermined BER threshold level include a subset of the collected BER values which are evaluated to determine whether BER values worsen over time. By contrast, Vieregge merely discloses determining if the latest BER value exceeds a threshold and determining that a rate of increase between two consecutive measurements must exceed some value. Vieregge fails to teach or suggest determining whether a set of collected BER values worsen over time, in response to a determination that BER values in a subset of the collected BER values satisfy a threshold. Thus, Vieregge fails to teach or suggest Applicant's claim 1." The Examiner

disagrees. As discussed above, Vieregge et al. teaches in col. 5, lines 61-64 to use two predicative thresholds may be used, and if the two thresholds are crossed in a short enough period of time, then the decision to instigate protection switching is made. That is, Vieregge et al. teaches making a decision based on a plurality of recent ones of the collected BER.

Regarding claim 12, the Applicant argues that Hartmann, alone or in combination with de Boer, fails to teach or suggest at least the limitation of "where the predetermined time is a maximum switching time for a ring network calculated using a number of nodes in the ring network and an optical fiber distance of the ring network," as claimed in Applicant's claim 12. The Examiner disagrees. de Boer et al. teaches in FIG. 7 detect failure step 118, transmit switching request step 124, ack received testing step 126 and timeout condition testing step 140. Hartmann et al. teaches in col. 4, lines 44-65 a formula for calculating timeout based on round trip time. It is common sense that the round time depends on the number of nodes in the network and the distance between the nodes. Therefore, the combination of de Boer et al. and Hartmann et al. teaches the limitation "where the predetermined time is a maximum switching time for a ring network calculated using a number of nodes in the ring network and an optical fiber distance of the ring network," as claimed in claim 12.

Regarding claim 20, the Applicant argues that Ryhorchuk, alone or in combination with Li, fails to teach or suggest at least the limitation of "in response to detection of a condition on said first optical channel without detection of a condition on said second optical channel, switching the in-band signal to a third optical channel using a span switch operation" and "in response to detection of a condition on said first optical channel and detection of a condition on said second optical, switching the in-band signal to a third optical channel using a ring switch

operation," as claimed in Applicant's claim 20. The Examiner disagrees. First, Li teaches in FIG. 23 that each fiber carries in-band wavelength channels λj and λk. Ryhorchuk further teaches out-of-band supervisory channel. That is, the combination of Li and Ryhorchuk teaches that a fiber carries channels λj, λk and supervisory channel. Li teaches paragraph [0052] span switch and ring switch. A span switch can be determined if the wavelength λj fails but supervisory channel in the same fiber does not fail. Then the data is switched to the other in-band channel λk of the same fiber. On the other hand, if both λj and supervisory channel fail, it is determined to be a fiber cut and a ring switch is necessary where channel λj of the first fiber is switched to λj of the other fiber.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 571 272-3031. The examiner can normally be reached on Monday-Friday (7:30 a.m. - 4:30 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

skl
17 November 2008

/Shi K. Li/
Primary Examiner, Art Unit 2613